MAYLOV, N.V.

Preparation of a strong viscose silk of a high denier. N. V. Mikhailov and B. M. Lev. *Tekstil. Prom.* 10, No. 10, 12-14(1950).—The centrifugal method of spinning for prepg. a strong viscose (I) with high denier and tenacity is discussed in detail. *Ibid.* No. 11, 21-2(1950).—The manuf. of I with a denier of 112.5-150 by centrifugal method is described. Elisabeth Barabash

CH

(1)

MIKHAYLOV, N.V.

(3)

Relaxation properties of crystallizing fibers obtained by polymerization. N. V. Mikhailov, M. V. Nechaeva, and V. G. Klemenan. *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedinenii*, 1952, 265-73.—It is shown that the greater is the deformation of polyamide fibers (I) the lower is their capability to restore their original shape. The speed of the restoration decreases when the deformation time increases. In an example I was stretched to 100%; after prompt release the deformation dropped immediately to 28%. However, when the stretching lasted 120 hrs., the whole 100% deformation remained permanently. When I was stretched to 200% and promptly released the deformation dropped immediately to 20%. When stretching lasted 210 hrs., the whole 200% deformation remained permanently. This behavior is analogous to "mech crystn." of certain rubbers or to "mech. vitrification" of amorphous cellulose fibers subjected to stretching.

F. J. Hendel

New data on the kinetics of the ripening of viscose Mikhailov, V. I. Mallseula, and V. A. Kargin. *Kolloid. Zhur.* 14, 57-65 (1952). Pptn. of cellulose xanthate (I) with NH_4Cl as an indicator of the degree of ripening of viscose (II) is not reliable because NH_4 salts of I are hydrolyzed by water and yield cellulose. The amt. of NH_4Cl needed for pptn. decreases rapidly during the first 60 hrs. of ripening and then slowly. A similar kink is observed also when II contains 30 (40?)% Na_2SO_4. Two other methods which show no such kink are (a) the concn. of CS_2 combined with cellulose decreases uniformly with time, and (b) the amt. of $NaHCO_3$ (instead of NH_4Cl) required for pptn. decreases in time almost linearly. The ratio of the data obtained by methods (a) and (b) also is an almost linear function of time. This is true also in the presence of Na_2SO_4. When 60 parts Na_2SO_4 are added to 100 parts α-cellulose, the amt. of $NaHCO_3$ decreases, e.g., from 14 to 8 cc. of 7% $NaHCO_3$ for 20 g. II after 60 hrs. of ripening. Na_2SO_4 (3 for 100 parts of α-cellulose) and (less pronounced) $Na_2S_2O_3$ (also 3:100) increase the amt. of $NaHCO_3$, while Na_3PO_4 (10:100) lowers it. The latter 3 salts similarly affect the titration with NH_4Cl without eliminating the kink. The rate of ripening (detd. with NH_4Cl) of II + 30% Na_2SO_4 at 10° is less than that of II alone at 15°. The concn. of NaOH is the main factor of stability of II. Solns. of II are mol. rather than colloidal. [illegible] [illegible]

J. J. Bikerman

MIKHAYLOV, M.V.; MAYBORODA, V.I.; KARGIN, V.A.; MIRONOVA, Ye...; BALANDINA, I.N.

New data on the kinetics of the ripening of viscose. Colloid.J. (U.S.S.R.) 14, 61-9 '52 [in English].
(Ca 47 no.19:10221 '53)

1. MIKHAYLOV, N. V.

2. USSR (600)

4. High Molecular Weight Compounds

7. Conference on high molecular weight compounds. Vest. AN SSSR 22 no. 9, 1952

Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

KHAYLOV, N.V.

USSR .

Study of the physical structure of synthetic polyamides by the method of the vibration spectra. N. V. Mikhailov, D. N. Shigorin, and S. P. Makar'eva. *Doklady Akad. Nauk S.S.S.R.* 87, 1009-12(1952).—The nature of the bonds that det. the phys. structure of synthetic polyamides was studied directly by infrared spectroscopic analysis of a polyamide of polycaprolactam. The infrared spectrum supports the assumption of the chain-cyclic mol. structure due to the presence of intra- and intermol. H bonds. J. R. L.

All-Union Sci. Res. Inst. Synthetic Fibers

MIKHAYLOV, N.V., laureat Stalinskoy premii, doktor khimicheskikh nauk.

[New kinds of fiber; artificial and synthetic fibers] Novye vidy volokon; iskusstvennye i sinteticheskie volokna. Moskva, "Znanie," 1953. 31 p. (Vsesoiuznoe obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii, Ser. 3, no.71) (MLRA 6:12)
(Textile fibers, Synthetic)

BUYANOV, A.F., inshener; MIKHAYLOV, N.V., laureat Stalinskoy premii, doktor khimicheskikh nauk, redaktor.

[Materials of the present and of the future] Materialy nastoiashchego i budushchego. Pod red. Mikhailova, N.V. Moskva, Voen. izd-vo, 1953. 127 p. (MLRA 7:7)
(Materials)

USSR/Chemistry - Synthetic Fibers Jul/Aug 53

"Investigation of the Structure of Polyamide Fibers. I. Sorption of Water by Polycaprolectam Fibers," N. V. Mikhaylov, E. Z. Faynberg, S. M. Skuratov, All-Union Sci-Res Inst of Syn Fibers

Koll Zhur, Vol 15, No 4, pp 271-276

Determined the effect of orientation (stretching) of polycaprolectam fibers on the adsorption and desorption of water. Showed that it is difficult to desorb the last traces of water from non-oriented

270T13

fibers. Assumes that impeded desorption is due to the presence of certain types of hydrogen bonds, and that the nature of these bonds changes with pressure.

270T13

HAYLOV, N.V.

The structure of polyamide fibers. I. Sorption of water by Capron fibers. N. V. Mikhailov, R. Z. Fainberg, and S. M. Skuratov. *Colloid J. U.S.S.R.* 15, 276–83(1953) (Engl. translation).—See *C.A.* 47, 11740h. H. L. H.

MIKHAYLOV, N.V.

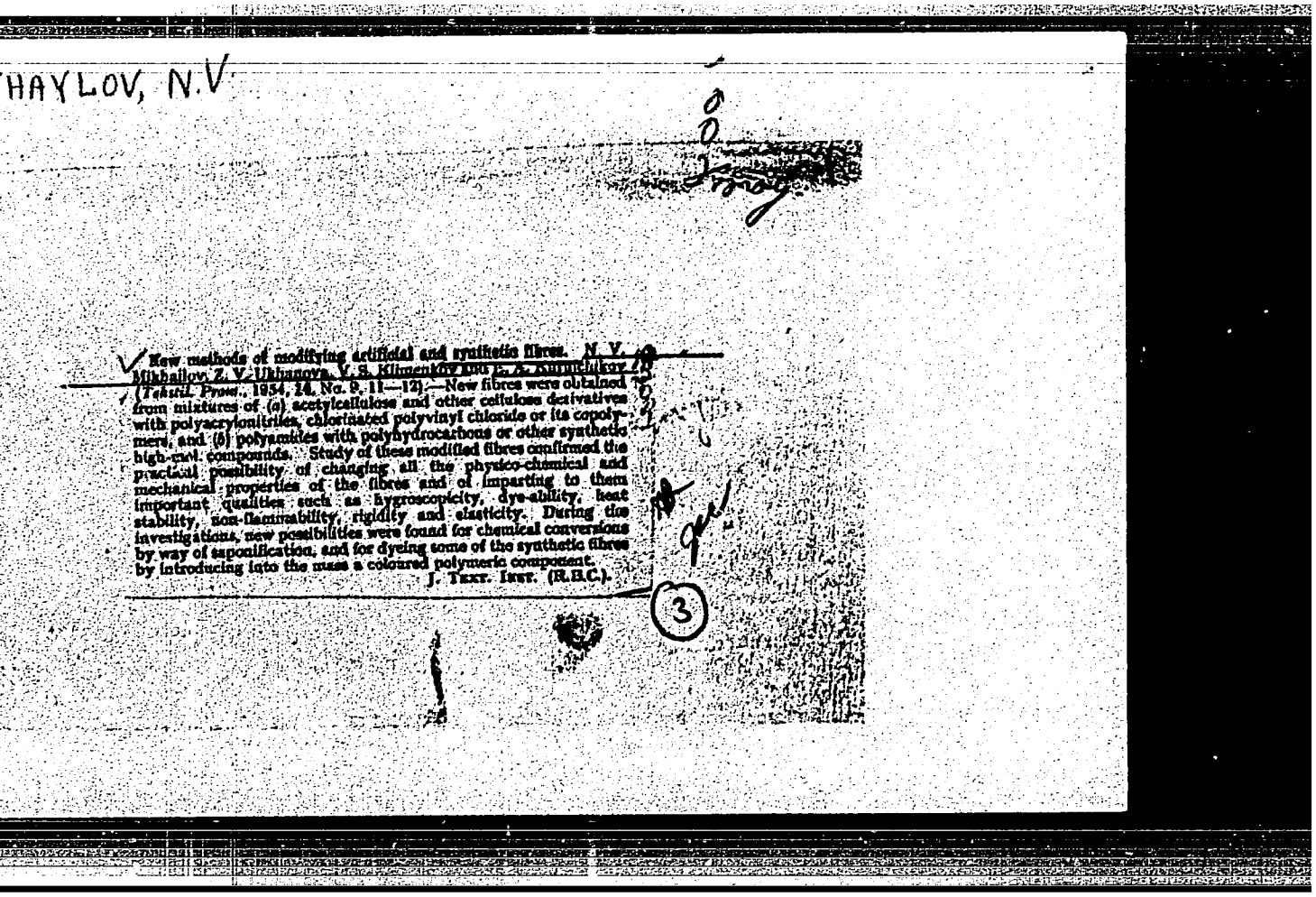
/10/1954
...ral and
...al Chemistry

3

(2)

Two structural modifications of synthetic polyamides in the solid state. N. V. Mikhailov and V. O. Klesman. *Doklady Akad. Nauk S.S.S.R.* 91, 99-102(1953).—Depending on the environmental conditions, synthetic polyamides can be obtained in either cryst. or glassy-amorphous states. These are transformed into each other reversibly. The cryst. form is imperfect and relatively unstable. The polyamide prepd. from caprolactam was examd. Soln. of polycaprolactam in HCO_2H on evapn. gave an opaque product, also obtained on slow cooling of molten material. Rapid cooling of a melt gave transparent or translucent form. X-ray diffraction of the former gave diffuse rings, that of the latter sharp rings. The interplanar distances were 8.29 A., and 4.95, 4.57, 4.21, and 3.78 A., resp., in the 2 groups. Thus the rapidly supercooled specimens are amorphous-glassy. Thermographic analysis made by slow cooling and heating of the specimens showed that the formation of the modification is a matter of kinetics only. The crystn. temp. is some 25° below "melting" temp. with several degrees interval of melting range. A dry specimen prepd. by slow cooling of a melt showed on slow reheating only a single endothermic effect of melting at 200-16°; the rapidly cooled specimen showed endothermic effects at 120-58° and at 216-22°. The 1st effect (120-58°) is ascribed to vitrification. The heat of fusion of the cryst. form is 12.4 cal./g. (1.4 kcal./mole), while that of the glassy modification is 9.4 cal./g. (1.06 kcal./mole). G. M. Kosolapoff

7-27-54



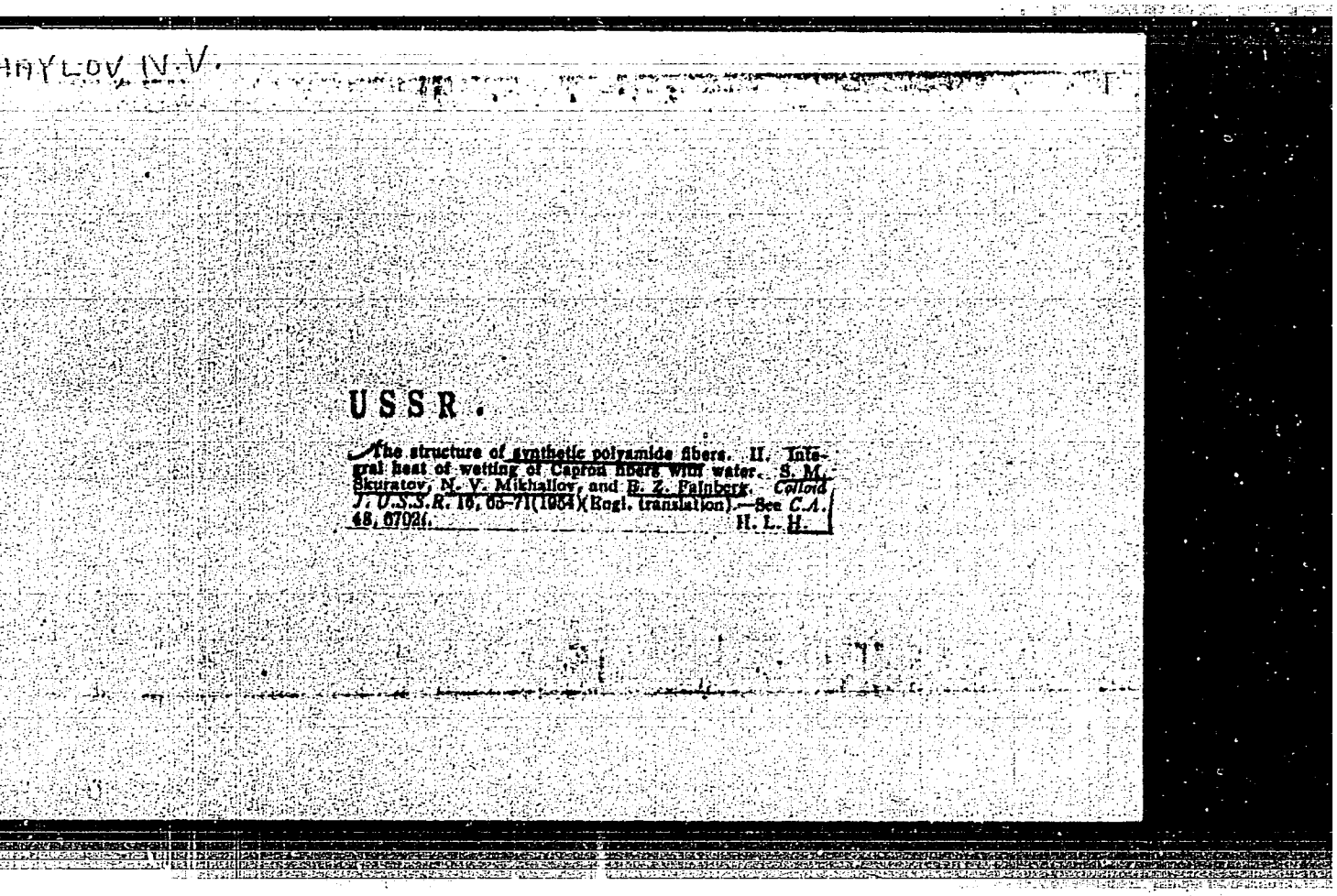
MIKHAYLOV, N.V.

New methods of modifying artificial and synthetic fibres. N. V. Mikhailov, Z. V. Ushanova, V. S. Klimenkov and L. A. Kuznetsov. (*Textil. Prom.*, 1954, 14, No. 9, 11—12).—New fibres were obtained from mixtures of (*a*) acetylcellulose and other cellulose derivatives with polyacrylonitriles, chlorinated polyvinyl chloride or its copolymers, and (*b*) polyamides with polyhydrocarbons or other synthetic high-mol. compounds. Study of these modified fibres confirmed the practical possibility of changing all the physico-chemical and mechanical properties of the fibres and of imparting to them important qualities such as hygroscopicity, dye-ability, heat stability, non-flammability, rigidity and elasticity. During the investigations, new possibilities were found for chemical conversions by way of saponification, and for dyeing some of the synthetic fibres by introducing into the mass a coloured polymeric component.
J. Text. Inst. (R.B.C.).

SKURATOV, S.M.; MIKHAYLOV, N.V.; FAYNBERG, E.Z.

Study of the structure of synthetic polyamide fibers. Part 2. Specific heats of wetting of caprone fiber by water. Koll.zhur. 16 no.1:58-64 Ja-F '54. (MLRA 7:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna. (Heat of wetting) (Caprone)



MIKHAYLOV, N. V.

USSR.

The structure of synthetic polyamide fibers. II. Integral heat of wetting of Caprón fibers with water. S. M. Skuratov, N. V. Mikhailov, and B. Z. Volnberg. *Colloid J. U.S.S.R.* 16, 65-71 (1954) (Engl. translation).—See *C.A.* 48, 07024. H. L. H.

KHAYLOV, M. [illegible].

3

(2)

15007* (Investigation of Polyamide Fiber Structure.) **Issledovanie struktury sinteticheskikh polfamidnykh volokon. III.** (Differential Heats of Water Sorption by Capron Fiber.) **Differentsial'nye teploty sorbtsii vody kapronovym volokonom.** N. V. Mikhailov and E. Z. Fainberg, *Kolloidnyi Zhurnal*, v. 16, no. 2, Mar.-Apr. 1954, p. 120-125.
Includes graphs. 11 ref.

MIKHAYLOV, N.V.; KLESMAN, V.O.

Study of the structure of synthetic polyamides. Part 4. Radiographic data on structural transformations. Koll.shur. 16 no.3:191-195 '54. (MLRA 7:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic) (Radiography)

MIKHAYLOV, N.V.; KLESMAN, V.O.

Investigation of the structure of synthetic polyamides. Part 5. Thermographic data on structural conversions in synthetic polyamides. Koll.zhur. 16 no.4:272-279 Jl-Ag '54. (MLRA 7:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Thermal analysis) (Textile fibers, Synthetic) (Amides)

(3)

11890* Investigation of the Physical Structure of Synthetic Polyamides by Method of Infra-Red Absorption Spectra. (Russian.) D. N. Shigorin, N. V. Mikhailov, and S. P. Makar'eva. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 717-720.

Synthetic polyamides show different molecular structure depending on conditions of formation. Table, graphs. 5 ref.

KHALOV, N. V.

USSR/ Chemistry - Physical chemistry

Card 1/1 : Pub. 22 - 36/46

Authors : Shigorin, D. N; Mikhaylov, N. V.; and Makaryeva, S. P.

Title : The physical structure of synthetic polyamides investigated by the infrared absorption spectra method

Periodical : Dok. AN SSSR 97/4, 711-714, Aug 1, 1954

Abstract : The application of the infrared absorption spectra method for the physico-chemical study of synthetic polyamides, is discussed. A comparison of absorption spectra of various synthetic polyamides showed that the structure of the latter is determined by a combination of three (alpha, beta, gamma) H-bonds. The existence of the three basic H-bonds in synthetic polyamides, which in fact determine their physical structure and chemical properties, was positively established. These three H-bonds are also responsible for the crystalline lattice of the synthetic polyamides. Eight references: 4-USSR and 4-USA (1936-1954). Table; drawing.

Institution : All-Union Scientific-Research Institute of Synthetic Fibers

Presented by : Academician V. A. Kargin, May 10, 1954

N.V.

MIKHAYLOV, N.V.; KLESMAN, V.O.

Phase conditions in polyacrylonitrile fibers and structural changes during the orientation of these fibers. Soob.o nauch. rab.chl.VKHO no.3:43-45 '55 (MIRA 10:10)
(Acrylonitrile)

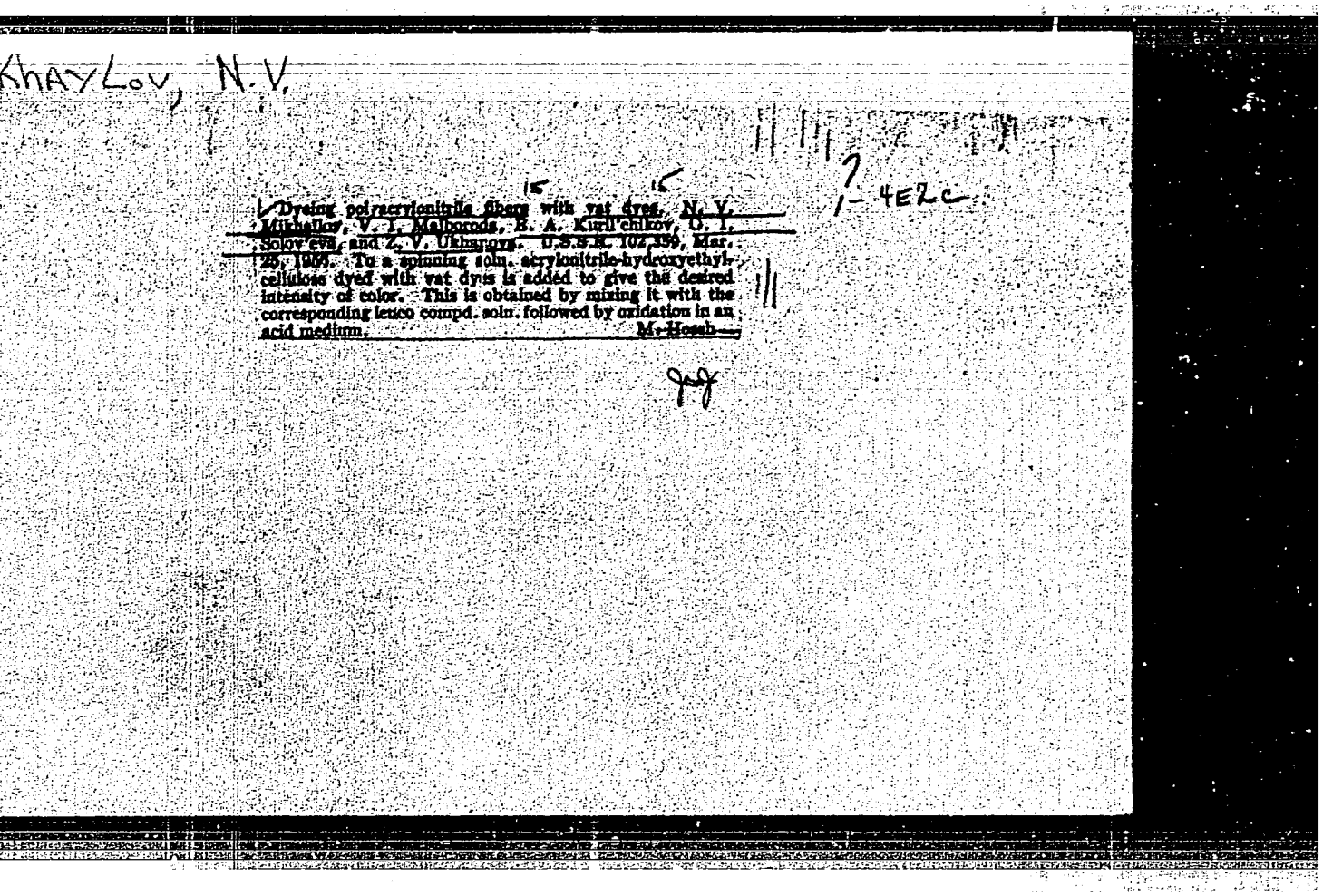
MIKHAYLOV, N.V.; UKHANOVA, Z.V.; POKROVSKAYA, N.B.

The relaxation mechanism in the formation of windings in synthetic fibers. Soob.o nauch.rab.chl.VKHO no.3:63-65 '55. (MIRA 10:10)
(Textile fibers, Synthetic)

MIKHAILOV, N.V.

Structure-mechanical properties of disperse and high-molecular systems. N. V. Mikhailov and P. A. Rebinder (Inst. Phys. Chem., Acad. Sci. U.S.S.R., Moscow). *Kolloid. Zhur.* 17, 107–10(1955); cf. *C.A.* 49, 7927b.—In liquidlike systems the effective viscosity η gradually decreases when the rate P of shear increases, whereas in solidlike bodies the drop of η occurs in a narrow interval of P values. The mech. properties of all structures can be characterized by instantaneous shear modulus, equil. shear modulus, viscosity of elastic aftereffect, max. limiting viscosity, and limit of flow, whereas liquidlike systems, in addn., have a stress limit of structure. The structure can be reversible (thixotropic) or irreversible (crystals). Mixts. of these two structures occur, e.g., in concrete. Also in *Colloid J.* 17, 99–105(1955)(Engl. translation).

J. J. Bikerman



Khaylov, N. V.

15 15

Dyeing polyacrylonitrile fibers with vat dyes. N. V. Khaylov, V. I. Mikhailov, V. I. Malborods, B. A. Kurll'chikov, O. I. Solov'eva, and Z. V. Ukhanova. U.S.S.R. 102,359, Mar. 25, 1957. To a spinning soln. acrylonitrile-hydroxyethylcellulose dyed with vat dyes is added to give the desired intensity of color. This is obtained by mixing it with the corresponding leuco compd. soln. followed by oxidation in an acid medium. M. Hosch

? 1-4E2c

MIKHAYLOV, N.V.; TOKAREVA, L.G.; KLIMENKOV, V.S.

Increasing the heat resistance of vinyl chloride polymers. Tekst. prom. 16 no.7:26-28 Jl '56. (MLRA 9:8)
(Vinyl polymers) (Textile fibers, Synthetic)

MIKHAYLOV, N.V.

5080

The structure of synthetic polyamide fibers. VI. The integral heat of dissolution of capron fibers in formic acid. N. V. Mikhailov and E. Z. Fainberg (All-Union Sci. Research Inst. Synthetic Fibers, Moscow). *Kolloid. Zhur.* 18, 44-8(1956); cf. C.A. 48, 8038g; 49, 6690e.—The heat Q of dissoln. of 1 g. unstretched polycaprolactam (I) in 50-100 g. 95% HCO_2H was 12.6 ± 0.3 cal., and Q of I, cold-stretched for 350%, was 11.5 ± 0.2 cal. Thus, stretching did not cause an essential change in the mol. structure. The heat of diln. of a 15% soln. of I in HCO_2H was 1.2-1.5 cal./g. when the final concn. was 0.4-3.5%. J. J. Bikerman

(2)

MIKHAYLOV, N.V

62R/ Chemistry of High-Molecular Substances F.

os Jour : Referat Zhur - Khimiya, No 4, 1957, 11919

uthor : Mikhaylov N.V., Faynberg E.Z.
itle : Investigation of Structure of Synthetic Polyamide Fibers. 7. Differential Heat of Dissolution of Capronic Fiber in Formic Acid

rig Pub : Kolloid. zh., 1956, 18, No 2, 208-214

ostract : Determined were the values of differential hat (DH) of dissolution of oriented and unoriented capronic fibers in formic acid, which are analogous to DH of water sorption (see Communication 6, RZhKhim, 1957, 8274) in this that they have two constant values. The same as in the case of sorption, on dissolution, there corresponds to a zero heat effect the same molar portion of water and formic acid, per 1 mole caprolactam. Difference in values of DH of oriented and unoriented fibers is interpreted on the basis of concepts of the existence in polycaprolactam of at least two types of hydrogen bonds, one of which relates to intramolecular bonds which are concerted, in

ard 1/2

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11919

the process of cold stretching of the fiber, to intermolecular bonds. On the basis of the fact that on stretching the number of bonds corresponding to the higher value of DH of dissolution, decrease almost to one-fifth (from 8.82% of sorbed acid to 1.74%), the authors reach the conclusion that during the process of stretching, stronger bonds are formed. Weaker bonds must be the intramolecular; hence the authors draw the conclusion that the process of cold stretching of fiber takes place by opening of intramolecular rings, formed by these bonds, and by formation of stronger intermolecular bonds which determine the crystalline structure of polycaprolactam. The authors consider that since on stretching no changes occur in the phase state of the fiber, it follows that physicomechanical properties of the fiber are determined only by the ratio of the different types of bonds.

KHAYLOV, N.V.

3

Structure of synthetic polyamide fibers. VIII. Heat effect of solution of crystalline and amorphous modifications of polycaprolactam. N. V. Mikhailov and E. Z. Fainberg. *Colloid J. U.S.S.R.* 18, 306-9(1956)(English translation).—See *C.A.* 51, 834g. B. M. R.

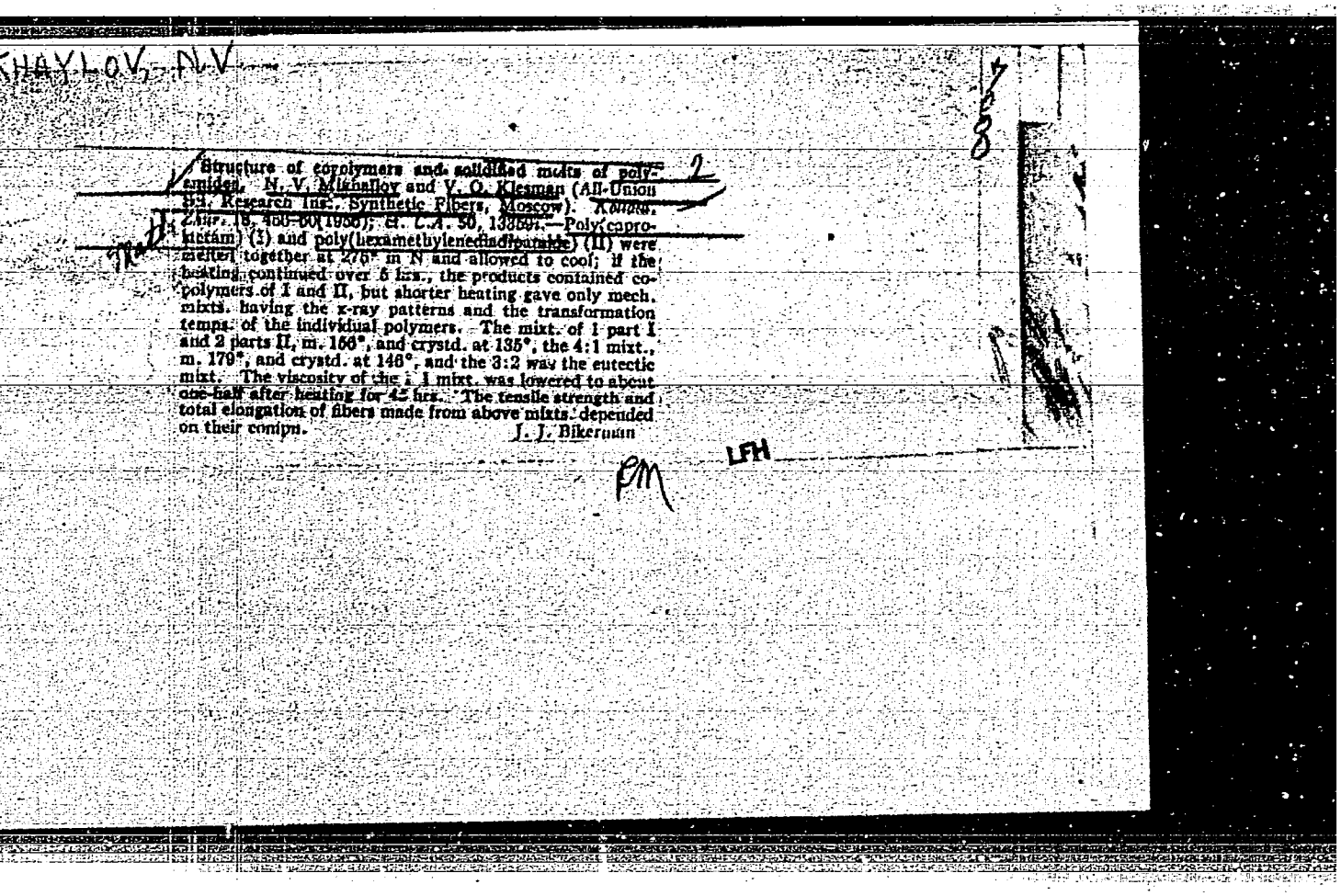
15

2 2 May

MIKHAYLOV, N.V.; FAYBERG, E.Z.

Studies on the structure of synthetic polyamide fibers. Part 8. The heats of solution of crystalline and amorphous modifications of polycaprolactam [with English summary in insert]. Kell.shur. 18 no.3:315-320 My-Je '56. (MIRA 9:9)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic)



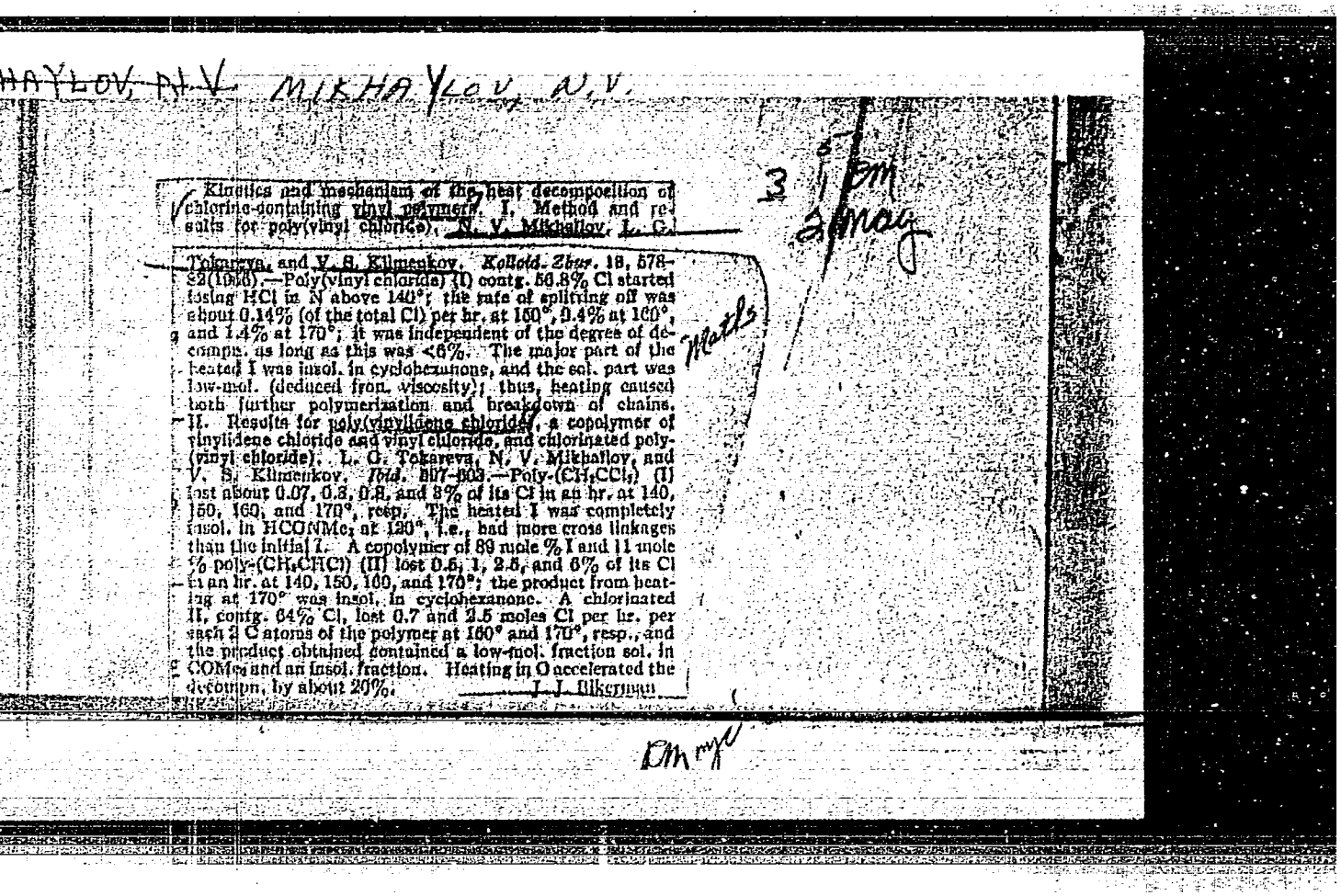
KHAYLOV, N.V.

Structure of copolymers and solidified melts of polyamides. N. V. Mikhailov and V. O. Klesman (All-Union Sci. Research Inst. Synthetic Fibers, Moscow). *Kolloid. Zhur.* 18, 465-80(1956); cf. *C.A.* 50, 13850f.—Poly(caprolactam) (I) and poly(hexamethyleneadipamide) (II) were melted together at 270° in N and allowed to cool; if the heating continued over 5 hrs., the products contained copolymers of I and II, but shorter heating gave only mech. mixts. having the x-ray patterns and the transformation temps. of the individual polymers. The mixt. of 1 part I and 2 parts II, m. 166°, and crystd. at 135°; the 4:1 mixt., m. 179°, and crystd. at 146°, and the 3:2 was the eutectic mixt. The viscosity of the 1:1 mixt. was lowered to about one-half after heating for 45 hrs. The tensile strength and total elongation of fibers made from above mixts. depended on their compn.

J. J. Bikerman

LFH

PM



MIKHAYLOV, N.V. MIKHAYLOV, N.V.

Kinetics and mechanism of the heat decomposition of chlorine-containing vinyl polymers. I. Method and results for poly(vinyl chloride). N. V. Mikhailov, L. G. Tokareva, and V. S. Klimenkov. *Kolloid. Zhur.* 18, 578–82(1956).—Poly(vinyl chloride) (I) contg. 56.8% Cl started losing HCl in N above 140°; the rate of splitting off was about 0.14% (of the total Cl) per hr. at 150°, 0.4% at 160°, and 1.4% at 170°; it was independent of the degree of decompn. as long as this was <6%. The major part of the heated I was insol. in cyclohexanone, and the sol. part was low-mol. (deduced from viscosity); thus, heating caused both further polymerization and breakdown of chains. II. Results for poly(vinylidene chloride), a copolymer of vinylidene chloride and vinyl chloride, and chlorinated poly(vinyl chloride). L. G. Tokareva, N. V. Mikhailov, and V. S. Klimenkov. *Ibid.* 597–603.—Poly-(CH_2CCl_2) (I) lost about 0.07, 0.3, 0.8, and 3% of its Cl in an hr. at 140, 150, 160, and 170°, resp. The heated I was completely insol. in HCONMe$_2$ at 120°, i.e., had more cross linkages than the initial I. A copolymer of 89 mole % I and 11 mole % poly-(CH_2CHCl) (II) lost 0.5, 1, 2.5, and 6% of its Cl in an hr. at 140, 150, 160, and 170°; the product from heating at 170° was insol. in cyclohexanone. A chlorinated II, contg. 64% Cl, lost 0.7 and 2.5 moles Cl per hr. per each 2 C atoms of the polymer at 160° and 170°, resp., and the product obtained contained a low-mol. fraction sol. in COMe$_2$ and an insol. fraction. Heating in O accelerated the decompn. by about 20%. —J. J. Bikerman

KHAYLOV, N.V.

2668. Investigation on the kinetics and mechanism of thermal breakdown of vinyl polymers containing chlorine. II. Results for polyvinyl chloride, a copolymer of vinylidene chloride and vinyl chloride, and chlorinated polyvinyl chloride. L. G. TOKAREVA, N. V. MIKHAILOV and V. S. KLIMENKOV. *Kolloid. Zhur.*, 1956, 18, No. 5, 597-603. The kinetics of evolution of hydrogen chloride from the above polymers in an atmosphere of nitrogen and oxygen at temperatures from 140 to 170°C, may be expressed by straight lines, i.e. the reaction of hydrogen chloride may be regarded as of zero order. The activation energy of hydrogen chloride evolution from polyvinylidene chloride and the above copolymer is respectively 33.6 and 30 kcal/g. mol. Oxygen is found to accelerate the decomposition of vinyl polymers containing chlorine. A mechanism for the thermal decomposition of such polymers is suggested, namely a radical-chain mechanism. A probable scheme is given for the beginning and development of this chain process of decomposition of vinyl polymers containing chlorine.

3B2H21.323

IKHAYLOV, N. V.

4E2c
2 May

The structure and properties of carbon-chain polymers in dilute solutions. I. Solutions of poly(vinyl chloride) and polyacrylonitrile. N. V. Mikhailov and Z. U. Zelikman. *Kolloid. Zhur.* 18, 717-23(1956).—Poly(vinyl chloride) (I) was fractionated by pptg. a soln. in PhCl + cyclohexanone + MeCO by MeOH. The reduced viscosity η/c (c = concn. in HCONMe$_2$) was almost independent of c for all fractions; between mol. wt. M of 47,000 and 170,000, η/c at $c = 0$ was $0.0004 M^{0.8}$. From the dependence of osmotic pressure π on c, I appeared to have flexible mols. and flexibility to increase with M. From the temp. coeff. of π between 20 and 50° the free energy, enthalpy, and entropy changes were calcd. Polyacrylonitrile (II) was fractionally ppted. from HCONMe$_2$ first by heptane and then by 2% CaCl$_2$ soln. The η/c increased with c above $c = 0.1\%$. The M of the fractions (88,000–71,000) was independent of temp. (when calcd. from η). The chains of II were less flexible than were those of I because of the different polarities of Cl and CN. The temp. coeff. of η between 20° and 60° was 0.04–0.07 for I and 0.13–0.35 for II.

J. J. Ilkerman

Central Sci Res Inst Artificial Fibers

USSR/Chemistry of High-Molecular Substances, F

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61709

Author: Mikhaylov, N. V., Zav'yalova, N. N.

Institution: None

Title: On the Nature of Structurization and Properties of Concentrated Viscose Solutions

Original Periodical: Zh. prikl. khimii, 1956, 29, No 1, 97-105

Abstract: A study of the dependence of total and structural viscosity of concentrated viscose solutions on the concentration of caustic soda and on the amount of alkali bound to the free OH-groups of the xanthogenate (γNaOH). Use was made of viscose samples having a cellulose concentration from 8 to 14% and various NaOH/cellulose ratios. For all the viscoses so obtained were determined summative $\gamma(CS_2 + NaOH)$, total structural viscosity of concentrated viscose solutions and viscosity of dilute solutions. By potentiometric titration of viscose with silver nitrate using a silver electrode

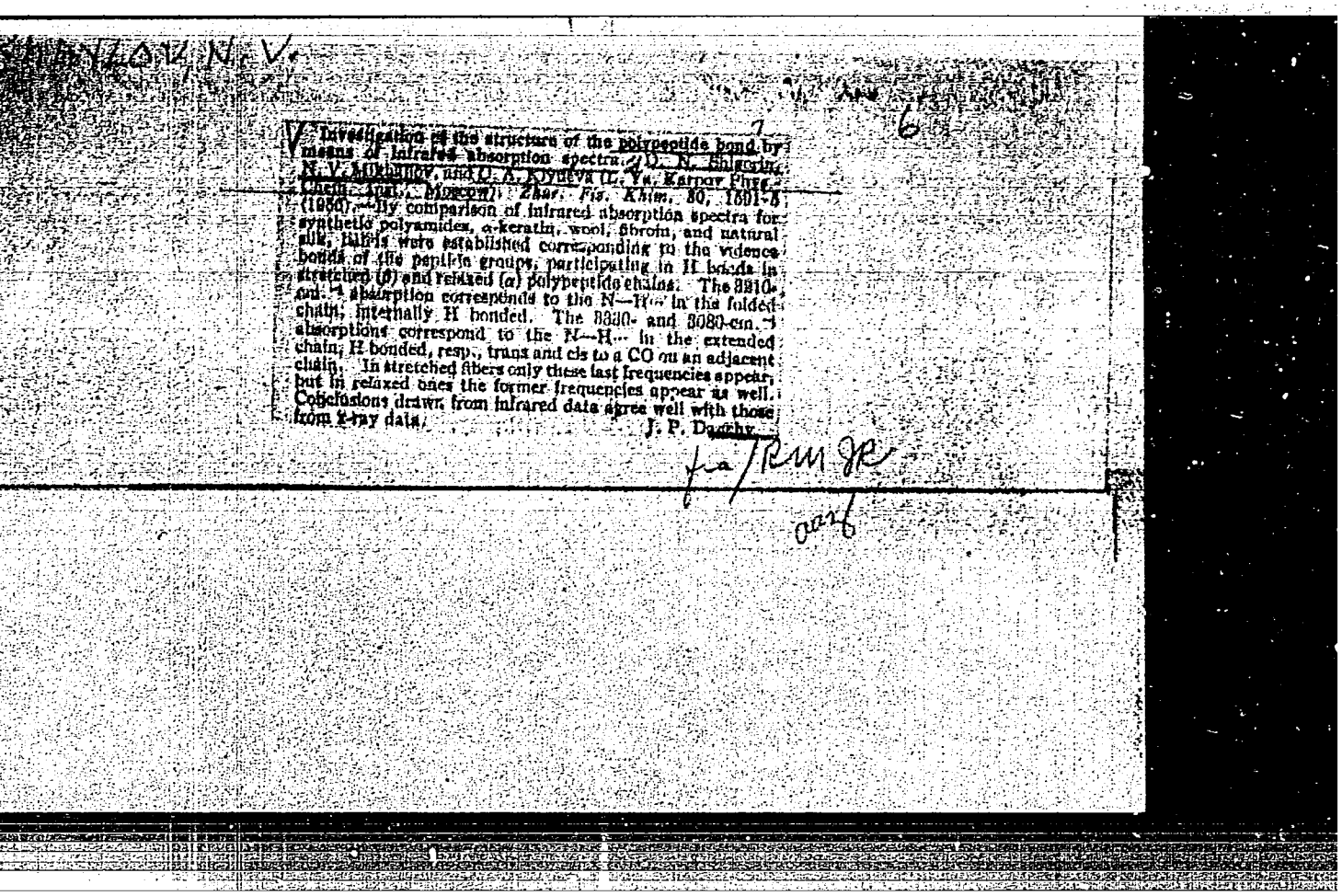
Card 1/2

R/Chemistry of High-Molecular Substances, F

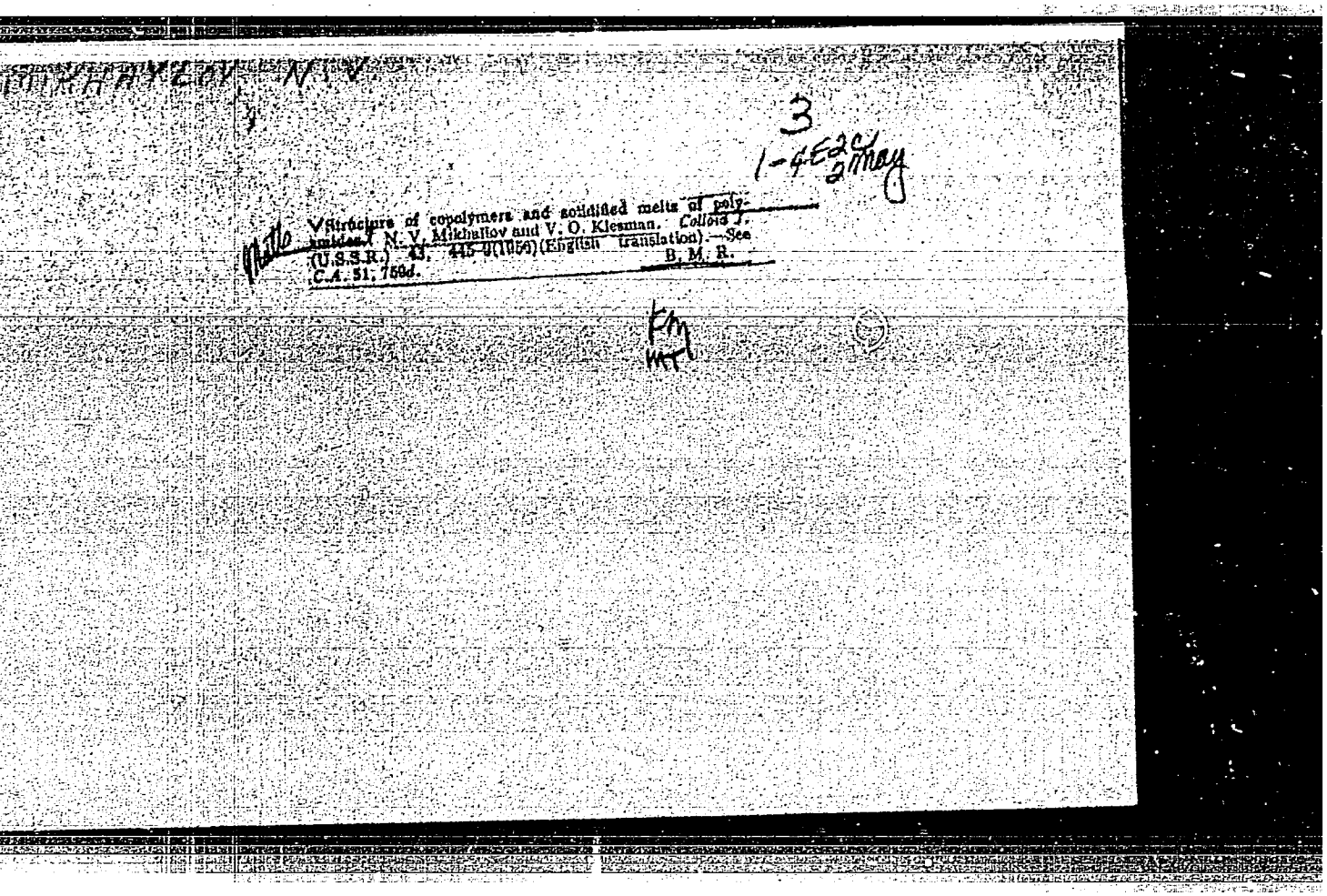
[illegible] Referat Zhur - Khimiya, No 19, 1956, 61709

Abstract: determination was made of $\gamma(CS_2 + NaOH)$. It was found that summative $\gamma(CS_2 + NaOH)$ depends upon the ratio NaOH/cellulose, and not on the absolute values of NaOH concentration in the viscose. It was found that maximum magnitude of $\gamma(CS_2 + NaOH)$ for the given viscoses is 300 with a NaOH/cellulose ratio of 1.3 and that the curves of dependence of total structural viscosity of the viscose upon the NaOH/cellulose ratio have a minimum. Minima of total structural viscosity of concentrated viscose solutions with a NaOH/cellulose ratio of 1.1-1.3 are attributed by the authors to replacement of OH-groups by alkali and CS_2, which results in a sharp decrease in the interaction between macromolecules of cellulose xanthogenate due to rupture of hydrogen bonds. Further increase in viscosity with increasing NaOH/cellulose ratio takes place due to decreased solubility of the xanthogenate. The absence of a minimum on the curve of dependence of the viscosity of a dilute solution (0.5% of visc. ose upon the NaOH/cellulose ratio, is due to the [illegible] interaction between macromolecules and their [illegible] spherical structures.

2/2



V. Investigation of the structure of the polypeptide bond by means of infrared absorption spectra. D. N. Shigorin, N. V. Mikhailov, and O. A. Kovaleva (L. Ya. Karpov Phys. Chem. Inst., Moscow). *Zhur. Fiz. Khim.*, 30, 1691-5 (1956).—By comparison of infrared absorption spectra for synthetic polyamides, α-keratin, wool, fibroin, and natural silk, bands were established corresponding to the valence bonds of the peptide groups, participating in H bonds in stretched (β) and relaxed (α) polypeptide chains. The 3310-cm.$^{-1}$ absorption corresponds to the N—H··· in the folded chain, internally H bonded. The 3300- and 3080-cm.$^{-1}$ absorptions correspond to the N—H··· in the extended chain, H bonded, resp., trans and cis to a CO on an adjacent chain. In stretched fibers only these last frequencies appear, but in relaxed ones the former frequencies appear as well. Conclusions drawn from infrared data agree well with those from X-ray data. J. P. Dworzak



3
1-462c
2 May

Structure of copolymers and solidified melts of polyamides. N. V. Mikhailov and V. O. Klesman. Colloid J. (U.S.S.R.) 13, 445-9(1956)(English translation).—See C.A. 51, 756d.

B. M. R.

USSR/Chemistry of High Molecular Substances. F

Abs Jour : Referat. Zhurnal Khimiya, No 6, 1957, 19418.

Author : N V. Mikhaylov, E.E. Faynberg.
Inst : [redacted]
Title : Concerning Phase State of Cellulose in Orientated Filaments.

Orig Pub : Dokl. AN SSSR, 1956, 109. No 6, 1160-1162.

Abstract : The heat of solution in the aqueous solution of a quaternary ammonium base of the type of $(C_2H_5)_3(C_6H_5)NOH$ (concentration 34%) was determined for hydratecellulose filaments stretched to various degrees (from 0 to 120%). The heat of solution is between 34.3 and 35.8 cal/g. In view of the obtained data, the authors arrive at the conclusion that hydratecellulose filaments do not alter their phase state in the whole orientation interval from isotropic to highly orientated, and remain amorphous.

Card 1/2 -8-

HAYLOV, N. V.

15

4E2c
4E4j
2-May

Production of viscose fibre. N. V. Mikhailov, V. I. Malboroda and V. A. Kargin (*Dokl. Akad. Nauk SSSR*, 1956, 111, 656–658).—A description is given of a method of production of viscose fibre. The basic chemical processes are: (1) formation of xanthate of fibre in baths containing Na_2CO_3; (2) decomposition of the cellulose xanthate and regeneration of fibre according to:

$3NaS \cdot CS \cdot OR + 3NaOH \rightarrow 3ROH + 2Na_2CS_3 + Na_2CO_3$;

(3) regeneration of NaOH and $NaHCO_3$ and saponification of by-products:

$$Na_2CO_3 + Ca(OH)_2 \rightarrow 2NaOH + CaCO_3;$$
$$Na_2CO_3 + CO_2 + H_2O \rightarrow 2NaHCO_3;$$
$$Na_2CS_3 + 6NaOH \rightarrow 3Na_2S + Na_2CO_3 + 3H_2O;$$
$$Na_2S + CO_2 + H_2O \rightarrow H_2S + Na_2CO_3;$$
$$H_2S + O \rightarrow S + H_2O.$$

P. Collins.

MIKHAYLOV, N. V. , and MAYBORODA, V. Y.

"Alkaline Hydrolysis of cellulose xanthate," a paper presented at the 9th Congress on the Chemistry and Physics of High Polymers, 26 Jan-2 Feb 57, Moscow, Textile Research Inst.

B-3,084,395

MIKHAYLOV, N. V., U[illegible]A[illegible]VA, S. V., KA[illegible]TI[illegible]A, T. Y., and [illegible]OVSKAYA, N. N.

"Compatibility of polymers, in solid state," a paper presented at the [illegible] Congress on The Chemistry and Physics of High Polymers, 27 Jan - [illegible], Moscow. [illegible] Inst. [illegible].

B-3,[illegible]4,[illegible]

KHAYLOV, N. V., All-Union Research Institute for Artificial Fibres, Moscow

"On the Phase Structure of Cellulose," a paper submitted at the International Symposium on Macromolecular Chemistry, 9-19 Sep 1957, Prague.

MIKHAYLOV, N. V., FAYNBERG, A. S., GAPSACHEVA, V. S., TAPCHITAJEVA,VN , and SHEYN, T. Y.

"Thermodynamic studies of the molecular structure of synthetic polyamides," a paper presented at the 9th Congress on the Chemistry and Physics of High Polymers, 27 Jan-2 Feb 57, Moscow, Polymer Research Inst.

B-3,NN,305

MIKHAYLOV, N. V.

15

Synthetic fiber. B. A. Kurl'chikov, N. V. Mikhaylov, Z. V. Ukhanova, and E. A. Iseeva. U.S.S.R. 104,725, Jan. 25, 1957. Addn. to U.S.S.R. 102,192. For the purpose of improving the physico-mech. properties of the fiber, to the spinning soln. are added reaction products of proteins with acrylonitrile sol. in methylformamide. The fibers are plasticized, drawn, and finished in the usual manner.

M. Hoseh

MIKHAYLOV, N. V., MAYBORODA, V. I., and KARGIN, V. A.

"The New Production Methods for Viscous Fibers."

TITLE: General Meeting of the Department for Chemical Sciences of the An USSR Held on May 30-31, and June 2?, 1958.

PERIODICAL: Izvestiya AN SSSR, Otdel. Khim. Nauk, 1,5?, Nr XII, pp. 1416-141? (USSR)

SEREBRYAKOVA, Z.G.; MIKHAYLOV, N.V.

The structure of chemical fibers. Tekst.prom. 17 no.9:19-22 S '57.
(MIRA 10:11)
(Textile fibers, Synthetic)

ZELIKMAN, S.G.; MIKHAYLOV, N.V.

Investigation of the structure and properties of carbon-chain polymers in dilute solutions. Part 2. Solutions of vinylchloride and acrylonitrile copolymers. Koll. zhur. 19 no.1:35-40 Ja-F '57. (MLRA 10:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna, g. Mytishchi.

(Acrylonitrile) (Ethylene)

HAYLOU, M. V.

Distr: 4E4j/4E2c(j)

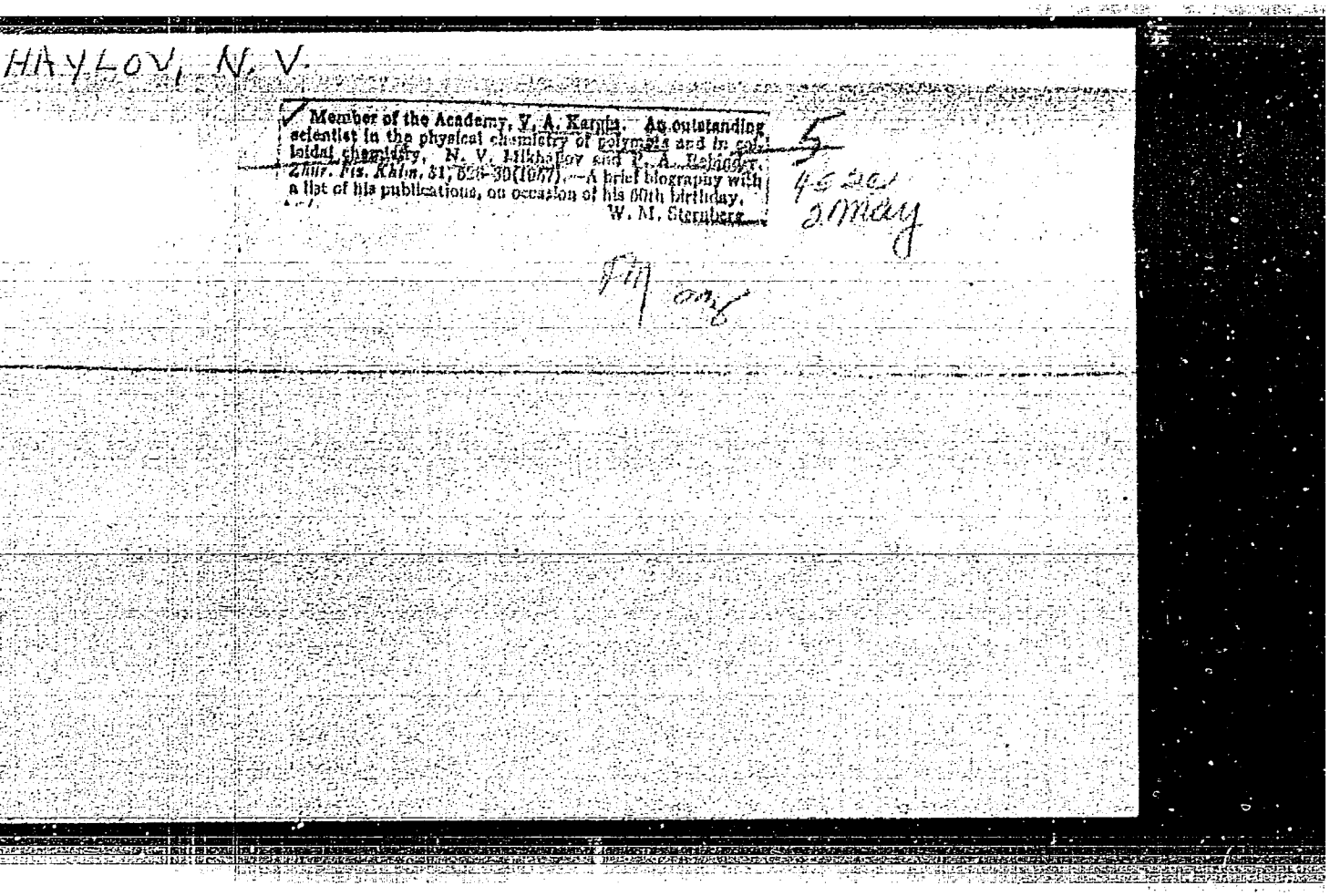
The structure and properties of carbon-chain polymers in dilute solutions. III. Mixtures of poly(vinyl chloride) and polyacrylonitrile. N. V. Mikhailov and S. G. Zelikman. *Kolloid. Zhur.* 19, 405–10(1957); cf. *C.A.* 51, 10191h.—Three mixts. of poly(vinyl chloride) and polyacrylonitrile with the ratios 13:87, 25:71, and 40:60 by wt. were studied. The viscosity η of their solns. (up to 1% was about twice that of the equally concd. solns. of copolymers of identical compn. The osmotic pressure of the mixed solns. at 20° was 1.6 to 1.8 times that calcd. from the additivity rule, whereas at 50° the ratio was only 1.2–1.3. The mol. wt. of the pure components was about 40,000. The temp. coeff. of η of mixed solns. between 20° and 60° was 0.08–0.10, and that of copolymers was 0.04–0.08. In the mixed solns. aggregation occurs, and the aggregates are less flexible than the corresponding copolymer mols. The difference is caused by the different mutual polarizations of CN and Cl in one mol. and 2 different mols.

J. J. Bikerman

5 2 may 2

MIKHAYLOV, N.V.; ZAV'YALOVA, N.N.

Study of the chemical stability and structure formation of concentrated viscous solutions at elevated temperatures. Zhur. prikl.khim. 30 no.1:136-142 Ja '57. (MLRA 10:5)
(Cellulose) (Viscosity) (Chemical structure)



HAYLOV, N. V.

Member of the Academy, V. A. Kargin. An outstanding scientist in the physical chemistry of polymers and in colloidal chemistry, N. V. Likhachev and P. A. Rebinder. *Zhur. Fiz. Khim.*, 31, 629-30(1957).—A brief biography with a list of his publications, on occasion of his 60th birthday.
W. M. Sternberg

5
45201
3 May

IKHAYLOV, N. V.

with D. N. Shigorin "Typical bands in infrared adsorption spectra"

report presented at the 10th All-Union Conf. on Highly Molecular Compounds, Biologically Active Polymer Compounds, Moscow, 11-13 June 1958. (Vest.Ak Nauk SSSR, 1958, No. 9, pp. 111-113)

IKHAYLOV, N. V. and REBINDER, P. A. (Moscow)

"The Rheological Properties of Bitumen and Influence of Temperature, Filler Additions, Solvents (Plastisizer) and Surface-Active Substances on the Same."

Report submitted Third Intl. Congress of Rheology, Bad Oeyngausen, GFR, 23-30 Sep 58.

REBINDER, P. A. and MIKHAYLOV, N. V. and IVANOVA-CHUMAKOVA, L. V.

"Rheological Examination Methods of the Formation and Development of Volume Structures in Colloidal and Polymer Solutions and the Results of the Application of these Methods."

Report submitted Third Intl. Congress of Rheology, Bad Oeyngausen, GFR, 23-30 Sep 58.

MIKHAYLOV, K. K. V.

(Manmade Fiber Research Institute, Moscow, USSR.)

"On the Phase Structure of Cellulose."
paper submitted at Soviet High-Polymers, Intl. Conference, Nottingham, UK, 21-24 July 1958.

B-3,177,661

Mikhaylov, N. V.

AUTHOR: Gorbacheva, V.O., and Mikhaylov, N.V. 69-20-1-6/20

TITLE: Structure and Phase State of Polyethylene Terephthalate Fibers (O strukture i fazovom sostoyanii volokon iz polietilentereftalata)

PERIODICAL: Kolloidnyy Zhurnal, 1958, Vol. XX, # 1, pp 38-42 (USSR)

ABSTRACT: Polyethylene terephthalate is a new polymer, which has been widely used in industry lately. It is employed in the production of synthetic fibers, films and plastics. It is resistant to acids, oxygen, light, bacteria, has a low permeability for gases and a sufficient mechanical resistance at various temperatures. In the article the structure of polyethylene terephthalate and fibers made from it by various processes are investigated. The specimens under investigation have a viscosity of 0.24-0.27. The fiber made from it was spun at 285°C and was stretched at 80-100°C to 550%. X-ray and thermographic analyses were made. Fig. 1 a, shows the roentgenogram of polyethylene terephthalate in the form of a solid transparent mass. This roentgenogram shows the unstretched fiber. The roentgen picture of both specimens is the same and is characterized by a broad interference, which is an indication of

Card 1/3

the amorphous structure of the substance. The phase state alone is no sufficient criteria for determining the structure of a polymer. The thermographic method of phase analysis was therefore also used. In fig. 2 a, the differential curves of heating and cooling of the initial polyethylene terephthalate. The thermographic picture changes, if the initial polymer and the unstretched fiber are preliminarily heated and the fiber stretched at increased temperature. In fig. 2 b, the thermograms of such specimens are presented. During heating of the polymer devitrification takes place and the kinetic energy of the links is increased. During devitrification or after it, in the solid state of the substance, crystallization takes place. In the heating curve, therefore, an exothermic effect in the temperature interval 105-150°C is observed (Fig. 2 a, area B). The obtained thermographic data was used for determining the melting heat of polyethylene terephthalate, which is 9-11 kcal/g. The crystallization of the polymer takes place at temperatures of 80-110°C.

69-20-1-6/20

ructure and Phase State of Polythylene Terephthalate Fibers

There are 2 figures, 2 tables, and 10 references, 5 of which are Soviet, 4 English, and 1 German.

SOCIATION: Institut iskusstvennogo volokna g. Mytishchi (Institute of Artificial Fibers in Mytishchi)

BMITTED: February 9, 1957

AILABLE: Library of Congress

rd 3/3

AUTHORS: Zav'yalova, N.N., Mikhaylov, N.V. SOV/69-20-6-6/15

TITLE: Factors Determining the Structural-Mechanical Properties of Viscose Solutions (O faktorakh, opredelyayushchikh strukturno-mekhanicheskiye svoystva viskoznykh rastvorov)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol 20, Nr 6, pp 708-712 (USSR)

ABSTRACT: The qualities of artificial fibers depend on the cellulose concentration in the viscous solution [Ref 1], on the degree of polymerization of the cellulose in the fiber [Ref 2], and on the formation conditions [Ref 3]. The concentration of α-cellulose, the NaOH/cellulose ratio, and the maturity are here investigated. Figure 1 shows the relation between deformation with time and shear stress. Figure 2 shows that the higher the maturity of the viscous solutions the greater the effective viscosity. The relative viscosity of solutions with different NaOH/cellulose ratios, not always changes with the maturity index (Figure 3). The influence of maturity often cancels the influence of the NaOH/cellulose relation and of the α-cellulose concentration, which is due to the appearance of new stable bonds. The stability of the structure in spinning solutions has a direct effect on the fiber formation. The greater the stability, the greater are the

Card 1/2

Factors Determining the Structural-Mechanical Properties of Viscose Solutions

difficulties in fiber formation. Spinning solutions should have low maturity values.
There are 5 graphs, 1 table, and 8 references, 7 of which are Soviet and 1 German.

ASSOCIATION: Nauchno-issledovatel'skiy institut iskusstvennogo volokna v Mytishchi (Scientific Research Institute of Artificial Fibers, in Mytishchi)

SUBMITTED: July 18, 1957

1. Synthetic fibers--Production 2. Synthetic fibers--Properties
3. Cellulose--Properties 4. Solutions--Properties

MIKHAYLOV, Nikolay Vasil'yevich, prof., doktor khim. nauk; FAYNBOYM, I.B., red.; ATROSHCHENKO, L.Ye., tekhn.red.

[Polymeric synthetic fibers] Polimernye khimicheskie volokna. Moskva, Izd-vo "Znanie," 1959. 47 p. (Vsesoiuznoe obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii. Ser. 9. Khimiia i fizika, no.9) (MIRA 12:5)
(Textile fibers, Synthetic) (Polymers)

MIKHAYLOV, N.V.; BUKOV, G.A.; GORBACHEVA, V.O.; MAKAROVA, T.P.; v rabote prinimali uchastiye: LARIONOV, P.E.; SOROKINA, V.I.; ZOTOV, Ya.E.

Studying the formation mechanism of synthetic fibers from molten materials. Khim.volok. no.1:33-36 '59. (MIRA 12:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic)

FAYNBERG, E.Z.; GORBACHEVA, V.O.; MIKHAYLOV, N.V.

Investigating the molecular structure of synthetic fibers. Report No.17: Polyenanthamide. Vysokom.soed. 1 no.1:17-20 Ja '59. (MIRA 12:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic) (Hepthanamide)

MIKHAYLOV, N.V.; FAYNBERG, E.Z.; GORBACHEVA, V.O.

Study of the molecular structure of stereoregular polymers. Isotatic polypropylene. Vysokom.soed. 1 no.1:143-148 Ja '59. (MIRA 12:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Polymers) (Propene)

MIKHAYLOV, N.V.; SHEYN, T.I.; GORBACHEVA, V.O.; TOPCHIBASHEVA, V.N.; v rabote prinimali uchastiye tekhniki-laboranty; LARIONOV, P.M.; VLASOVA, L.P.; MURASHKINA, S.I.

Investigating the molecular structure of synthetic fibers. Part 14: Physicochemical and physicomechanical properties of the polycapramide - polyundecanamide polyamide group. Vysokom. soed. 1 no.2:185-190 F '59. (MIRA 12:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic) (Amides)

MIKHAYLOV, N.V.; FAYNBERG, E.Z.

Study of the molecular structure of synthetic fibers. Part 15: Thermochemical properties of the polycapramide - polyundecanamide polyamide group. Vysokom.soed. 1 no.2:201-207 F '59. (MIRA 12:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic) (Amides)

KHAYLOV, N.V.

ne molecular structure of polyamide fibers. XVI. stigation of the sorption properties of polyamide fibers function of their structure. Z. G. Serebryakova and . Mikhailov. *Vysokomolekulyarnye Soedineniya, Ves- Khim. Obshchestvo im. D. I. Mendeleeva* 1, No. 2, 222–59); cf. *C.A.* 53, 23.—The sorption of H_2O vapor olycaprolactam (I) fibers was studied with respect to structure. The samples of I (surface values: 2.0 μ 30.0 μ in diam.) with artificial porosity were prepd. sing 1–3% finely powd. (1 μ) KCl in the process of formation. KCl was finally eliminated from I by ing with hot (90°) and cold H_2O, and KCl contents detd. by means of $AgNO_3$. H_2O sorption was detd. rding to Mikhailov's technique (*C.A.* 47, 11740*h*). It shown that the moisture sorption is not related to the acter of the phase structure of I as well as to the inal —CONH— polyamide units and may presumably arried out through the diffusion mechanism in the whole me of fibers. The difference between sorption of the or by cryst. or by amorphous I (obtained by slow or fast cooling of polyamide melt, resp.) is due only to the mol. packing d., which may be changed within sufficiently broad limits under the conditions of formation. Both of these modifications have different sorption properties, e.g., an amorphous I at p/p_0 (relative vapor pressure) of 0.65 sorbed 20% H_2O more than did a cryst. I; this difference, however, was decreased gradually when the values of p/p_0 decreased. By changing the mol. packing d. of I in the process of drawing fibers from the melt, equil. sorption can be varied over a broad range of values, allowing cryst. and amorphous fibers to be obtained with the same sorption properties (at $p/p_0 = 0.15$ or 0.35–0.40). Changes in the mutual arrangement of the chains or in the degree of crystallinity of I (changes of the phys. structure) lead always to changes in the sorption properties and therefore open the way for controlling them in the desired direction. X-ray diagrams and isotherm graphs of the moisture sorption by cryst. and amorphous I are reported. 14 references.

Eugène M. Griysky

MIKHAYLOV, N.V.; TOKAREVA, L.G.; FAYNBERG, E.Z.

Compatibility and mechanism of the stabilization of mixtures of fiber-forming polymers. Vysokom. soed. 1 no.3:404-409 Mr '59. (MIRA 12:10)

1. Nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Polymers)

MIKHAYLOV, N.V.; FAYNBERG, E.Z.

Molecular structure of synthetic fibers. Part 16: Sorption of water vapors and heat effects of the wetting of enanthic fibers with water. Vysokom. soed. 1 no.3:410-414 Mr '59.
(MIRA 12:10)

1.Nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Heptanamide)

ZELIKMAN, S.G.; MIKHAYLOV, N.V.

Study of the structure and properties of carbochain polymers in dilute solutions. Part 4: Integral and differential heats of solution and density of polymers. Vysokom.soed. 1 no.7:1077-1085 Jl '59. (MIRA 12:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.

(Heat of solution) (Polymers)

USMANOV, Kh.U.; MIKHAYLOV, N.V.; KOZLOV, P.V.

Tashkent All-Union Conference on the Chemistry and Physics of Cellulose. Vysokom. soed. 1 no.9:1439-1450 S '59.
(MIRA 13:3)

(Tashkent--Cellulose--Congresses)

MIKHAYLOV, N.V.; PLATONOV, V.A.

Use of the vapor condensation method for heating viscose solutions. Khim. volok. no.2:40-43 '59. (MIRA 12:9)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Viscose)

MIKHAYLOV, N.V.; ZAV'YALOVA, N.N.

Effect of the temperature and ripening index on the structure of viscose solutions and on fiber formation. Khim. volok. no.2: 44-47 '59. (MIRA 12:9)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Rayon)

5(2) SOV/69-21-2-21/22

AUTHORS: Mikhaylov, N.V., Mayboroda, V.I., Nikolayeva, S.S.

TITLE: On the Preparation and Some Qualities of Lyophobic Colloids of Fiber-Forming Polymers (K voprosu polucheniya i nekotorykh svoystv liofobnykh kolloidov voloknoobrazuyushchikh polimerov)

PERIODICAL: Kolloidnyy zhurnal, 1959, Nr 2, pp 246-247 (USSR)

ABSTRACT: The authors describe an experiment, by means of which colloid solutions of polyethyleneterphthalate (with a concentration of 4.5%) and polycaprolactam (with a concentration of 2%), were prepared for the first time. The solutions were obtained according to the following methods. One to two g of a powderized polycaprolactam crumb were dissoved in 50 ml of glycerine previously warmed to 200°C. Under intensive mixing and cooling the obtained solution was poured in a fine stream into an equal volume of a carbosoline C (0.5%) water solution, which had been previously cooled to 5°C. 3.5 g of a powderized polyethyleneterephthalate crumb were dissolved at 190°C in 40 ml of dimethylformamide. Under intensive

Card 1/2

On the Preparation and Some Qualities of Lyophobic Colloids of Fiber-Forming Polymers

mixing and at room temperature, the obtained solution was poured in a fine stream into an equal volume of a water solution of preparation OP-10 (2%). The authors also examined some physical and chemical qualities of the obtained sols. The results are specified in a special table. There are 2 photos and 5 references, 3 of which are Soviet and 2 English.

ASSOCIATION: Nauchno-issledovatel'skiy institut iskusstvennogo volokna, Mytishchi (Scientific Research Institute of Synthetic Fiber, Mytishchi)

SUBMITTED: January 2, 1959

MIKHAYLOV, N.V.; UKHANOVA, Z.V.; KARETINA, T.I.

Investigating solutions of polymer mixtures and factors determining their stability. Khim.volok. no.3:18-22 '59.
(MIRA 12:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (VNIIV).
(Polymers)

MIKHAYLOV, N.V.

5(3)

SOV/63-4-3-19/31

AUTHORS: Mogilevskiy, Ye.M., Candidate of Technical Sciences, Finger, G.G.

TITLE: Scientific-Technical Conferences and a Seminar on the Production and Processing of Chemical Fibers

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 3, pp 398-401 (USSR)

ABSTRACT: In November-December 1958 the All-Union Scientific-Technical Conference on Problems of the Application of Chemical Fibers in the Textile, Knit Goods and Haberdashery Industry [illegible] It was attended by 300 persons of plants and scientific research and designing installations. The President of the Gosudarstvennyy komitet Soveta ministrov SSSR po khimii (State Committee for Chemistry in the Council of Ministers of the USSR) V.S. Fedorov pointed out the great importance of developing the production of chemical fibers. A.L. Borisov (Upravleniye khimicheskikh volokon - Board of Chemical Fibers) read a paper on the tasks of workers of the industry of chemical fibers; Candidate of Technical Sciences G.I. Kudryavtsev (VNIIV) on the subjects of research work in the field of chemical fibers; S.L. Dich (GIPROIV) on new techniques applied in newly built plants; I.G. Shimko (Kiyevskiy kombinat iskusstvennykh volokon - Kiyev Combine of Artificial Fibers) on research conducted in the combine concerning the production of caprone fiber and artificial silk; V.P. Yanitskiy (Kalininskiy kombinat - Kalinin Combine) on technical improvements in the Combine; Professor N.V. Mikhaylov on: "Work in the Field of Preparing Highly-Resistant Viscose Cord"; S.M. Geysberg (Leningradskiy zavod iskusstvennogo volokna - Leningrad Plant of Artificial Fibers) on the experience of introducing a unit for the continuous production of alkali cellulose; Candidate of Technical Sciences Ye.M. Mogilevskiy (VNIIV) on the development of apparatuses for the continuous production of viscose silk; I.P. Zakharov and S.P. Lipinskiy (VNIIV) on increasing the spinning rate for viscose silk to 90 - 95 m/min and on the electric spindle EV-3 developed by them; L.M. Slobodkina, Kalinin Combine, on the method of regenerating the precipitation tank by contact with smoke gases which has been developed in the USSR; B.G. Zabrodin, Kalinin Combine, and Ye.P. Volkov (Mogilevskiy zavod iskusstvennogo volokna - Mogilev Plant of Artificial Fiber) on the work of viscose fiber plants and its improvement; N.N. Agranovskiy (VNIIV) and Ye.S. Marzon (GIPROIV) on the production of carbon disulfide; G.A. Boronichev, Kalinin Combine, on the work of an installation for the regeneration of carbon disulfide; N.A. Khrustin, Kiyev Combine, and Candidate of Technical Sciences M.D. [illegible] (VNIIV) on the continuous production of caprolactam and the spinning of caprone silk; Candidate of Technical Sciences E.V. Khayt (VNIIV) on the production of caprone cord fiber; N.I. Petrunin, Kalinin Combine, and Candidate of Technical Sciences B.V. Petukhov (VNIIV) on the production of the fibers nitron and lavsan; T.A. Dikov (Klinskiy kombinat - Klin Combine) on the improvement of the quality of caprone cord and silk. A seminar on the subject: "New Technique and Advanced Technology in the Production of Artificial and Synthetic Fibers and Semi-Finished Products for Them" took place December 18-20, 1958. N.Ya. Alekhin (GUKK SSSR) read a paper on the development of chemical fibers; Candidate of Chemical Sciences G.I. Kudryavtsev on achievements in the field of the production of synthetic fibers; Candidate of Technical Sciences Ye.M. Mogilevskiy on technological achievements in the production of viscose fibers; G.G. Finger (VNIIV) on the acceleration of the desulfuration process of viscose silk without application of alkali reagent; A.P. Kraynov (Branch of VNIIV) on the formation of fibers from triacetylcellulose sirups; Candidate of Technical Sciences A.A. Beer on "The Preparation of Monomers for Synthetic Fibers Based on the Reaction of Telomerization"; Candidate of Technical Sciences A.A. Artem'yev and Ye.V. Genkina (GIAP) on the preparation of raw material for polyamide fibers; Candidate of Technical Sciences V.S. Khaylov and Ye.G. Vendel'shteyn (GIAP) on the preparation of dimethylterephthalate for polyester fiber.

Card 3/6

Card 4/6

Card 5/6

MIKHAYLOV, N.V.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya I. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries. Section I.) [Moscow, Izd-vo AN SSSR, 1960] 346 p. 5,500 copies printed.

Sponsoring Agency: The International Union of Pure and Applied Chemistry, Commission on Macromolecular Chemistry

Tech. Ed.: T. V. Polyakova.

PURPOSE: This collection of articles is intended for chemists and researchers interested in macromolecular chemistry.

COVERAGE: This is Section I of a multivolume work containing scientific papers on macromolecular chemistry in Moscow. The material includes data on the synthesis and properties of polymers, and on the processes of polymerization,

copolymerization, polycondensation, and polyrecombination. Each text is presented in full or summarized in French, English, and Russian. There are 47 papers, 28 of which were presented by Soviet, Rumanian, Hungarian, and Czechoslovakian scientists. No personalities are mentioned. References accompany individual articles.

AVAILABLE: Library of Congress

Card 9/9

JA/dwm/kb
9-29-61

27

Card 6/9

49

MIKHAYLOV, N.V.; ZAV'YALOVA, N.N.; GORBACHEVA, V.O.

Gradient method of determining the specific gravity of synthetic fibers. Khim.volok. no.1:19-22 '60. (MIRA 13:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Textile fibers, Synthetic) (Specific gravity)

KOZLER, M.; FAYNBERG, E.Z.; MIKHAYLOV, N.V.

Measurement of the density of polymers by the electromagnetic float method. Vysokom. soed. 2 no. 3:444-450 Mr '60.
(MIRA 13:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna i Institut khimicheskikh volokon, Chekhoslovakiya.
(Polymers)

15.5540 2209, 1526 only

84517
S/190/60/002/004/019/020
B004/B056

AUTHORS. Mikhaylov, N. V., Tokareva, L. G., Kovaleva, M. V.

TITLE: Investigation of the Mechanism of the Aging of Synthetic Fibers. I. Investigation of the Thermal and Thermal-oxidative Action Upon Polyamide and the Fibers Made From Such

PERIODICAL. Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 4, pp. 581-589

TEXT: The authors give a report on the investigation of the behavior of polyhexamethyleneadipinamide (PHMAA) and the anid fiber, polycapronamide (PCA) and the caprone fiber at 160° to 220°C in a nitrogen atmosphere or in air and in oxygen. The volatile products were received in liquid oxygen. Of PHMAA and PCA both industrial samples as also such as were purified by re-precipitation were used. In the case of PCA, the viscosity rose with purely thermal treatment (in nitrogen) and fell as a result of thermal-oxidative treatment (Table 1). As shown by Fig. 1, the re-precipitated PCA was more stable than the non-purified substance. PHMAA

Card 1/3

Investigation of the Mechanism of the Aging of Synthetic Fibers. I. Investigation of the Thermal and Thermal-oxidative Action Upon Polyamide and the Fibers Made From Such

S/190/60/002/004/019/020
B004/B056

heated in nitrogen showed a complex change in its viscosity between 170° and 200°C (Fig. 2). A minimum at first occurred as the result of predominating destruction processes (Table 2), viz. in the non-purified polymer this occurred earlier than in the purified one. In the course of further heating, a maximum of viscosity was observed, which is explained by processes of structural formation. Finally, the polymer becomes insoluble. As analysis of Table 3 show, the elementary composition of the PHMAA changes little during heating. In the case of anid- and caprone fibers (Table 4, Fig. 3) increased viscosity occurs at first during heating at nitrogen current. In the case of oxidative heating the viscosity decreases. Above 200°C, the caprone fiber becomes insoluble more quickly than the anid fiber , which is more resistant to temperature influences. Figs. 4,6 show the change in the strength and deformation of the fibers between -80 and +200°C The mechanical properties of the fibers in this temperature interval undergo several changes. A thermal amorphization was observed near the melting point of the crystalline

Investigation of the Mechanism of the Aging of Synthetic Fibers. I. Investigation of the Thermal and Thermal-oxidative Action Upon Polyamide and the Fibers Made From Such

S/190/60/002/004/019/020
B004/B056

phase. Figs. 5 and 7 show the change in the strength and deformation of fibers, which had been previously heated to various temperatures. In nitrogen, the breaking length increased, in air irreversible decrease of strength occurred. The behavior of the polyamid fibers is explained by structural transformations in the supermolecular secondary structure. The authors mention a paper by S. R. Rafikov and R. A. Sorokina (Ref. 6). A. M. Glebova, Technician, took part in the experiments. There are 7 figures, 4 tables, and 15 references: 3 Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute of Synthetic Fibers)

SUBMITTED: January 18, 1960

Card 3/3

MIKHAYLOV, M.V.; KLYUYEVA, O.A.; GORBACHEVA, V.O.; FAYNBERG, E.Z.

Elucidation of the relation between the structure and orientation of the molecular chains in polyethylene terephthalate. Vysokom.soed. 2 no.6:942-946 Je '60. (MIRA 13:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Terephthalic acid) (Polyethylene)

87023

S/190/60/002/007/002/017
B020/B052

15 5540 2209

AUTHORS: Mikhaylov, N. V., Mayboroda, V. I., Nikolayeva, S. S.

TITLE: Fiber Formation in the Process of Interfacial Polycondensation of Polyamides

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 7, pp. 989-993

TEXT: The experimental results obtained by applying for the first time the methods of fiber formation in polycondensation (Ref. 5), are discussed here. Fiber formation of the following monomer systems was performed: sebacic acid chloride and hexamethylene diamine, terephthalic acid chloride and hexamethylene diamine. Fig. 1 shows the fiber formation scheme in interfacial polycondensation. The investigations show that every monomer system has its own characteristics in the fiber formation. The results of the present paper hold for the system sebacic acid chloride - hexamethylene diamine, in which the solution of the one component was pressed through a spinneret in the widened part of a vertical tube, and the solution of the other component was pressed through the

Card 1/3

tube. The effects of a change in the concentration of the initial monomers and the diameter of the spinneret on the specific viscosity and yield of the developing polymer, were studied. The results are given in Table 1. Fig. 2 shows the dependence of the yield and specific viscosity of the polymer during the fiber formation on the hexamethylene diamine concentration with a sebacic acid dichloride concentration of 0.43 mole/l. Fig. 3 gives the effect of the reaction temperature on the yield and specific viscosity of the polymer developing during the fiber formation. The dependence of the specific viscosity of the developed polymer on the purity of the initial sebacic acid chloride is given in Fig. 4. A temperature rise from 20 to 50°C practically has no effect on the specific viscosity, but deteriorates yield and fiber formation conditions. With a purity of sebacic acid chloride lower than 98%, fiber formation does not take place. Data on the effect of the solvent on the yield and specific viscosity of the developing polymer are given in Table 2. Table 3 gives the effect of hydrodynamic and static reaction conditions on the yield and specific viscosity of the polymer. The results show that the yields of the polymer and its specific viscosity are high, when the production is conducted at the boundary of mobile monomer solutions. The crystalline

87023

Fiber Formation in the Process of Interfacial Polycondensation of Polyamides

S/190/60/002/007/002/017
B020/B052

structure of polymers is shown in the X-ray picture of Fig. 5. Fig. 6 gives the electron microscopic pictures of polyhexasebacic amide, and Fig. 7 the cross section of the polyhexasebacic amide fiber produced by interfacial polycondensation, and having the characteristic shape of hollow tubes. Investigations on this subject are being continued at the institute mentioned in the Association. V. O. Gorbacheva and V. P. Kovaleva are mentioned. There are 7 figures, 3 tables, and 5 references: 1 Soviet, 1 German, and 3 US.

ASSOCIATION: Nauchno-issledovatel'skiy institut iskusstvennogo volokna (Scientific Research Institute of Synthetic Fibers)

SUBMITTED: February 17, 1960

Card 3/3

MIKHAYLOV, N.V.; FAYNBERG, E.Z.; KOZLER, M.

Fine molecular structure of oriented fibers of regenerated cellulose. Vysokom.soed. 2 no.7:1031-1038 Jl '60.
(MIRA 13:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna i Institut khimicheskikh volokon Chekhoslovakii.
(Cellulose)

S/190/60/002/007/007/017
B020/B052

AUTHORS: Faynberg, E. Z., Mikhaylov, N. V.

TITLE: Investigation of the Reaction Kinetics of Interfacial Polycondensation by Measurement of the Electrical Conductivity

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 7, pp. 1039-1044

TEXT: The authors attempted to investigate the kinetics of interfacial polycondensation in dependence on the working conditions. However, they found that the conventional methods of studying polycondensation were impossible in this case. The criterion of the reaction rate chosen, was the concentration change of diamine found by measurement of the electrical conductivity of the aqueous diamine phase at an arbitrary moment of the reaction course. The present paper describes the development of a method of measuring the electrical conductivity, which guarantees comparable results for different systems. Benzene adipic acid-, and sebacic acid dichloride solutions, and aqueous hexamethylene diamine solutions were used. Quaternary ammonium bases of the triethyl-benzyl ammonium hydroxide type

were used as detergents. The reaction course was investigated in dependence on the concentrations of acid chloride, diamine, and detergents. It was sufficient to know the concentration of diamine. Fig. 1 shows the vessel used for measuring the electrical conductivity. The lower part of the vessel has a hollow for the magnetic mixer. In the first experimental stages, measuring was carried out with a vacuum-tube voltmeter. The measuring scheme is described in Fig. 2; the voltage measuring accuracy was 0.2 mv. The dependence of the potential change read on the millivoltmeter, on the amount of the water added, was linear. This allowed the determination of the amount of diamine reacting at any time. Later, an electronic bridge (Scheme in Fig. 3) was used instead of the vacuum-tube voltmeter, by which the measuring accuracy was increased, and the measuring results could be automatically recorded. Fig. 4 shows the change of resistivity of the bridge as a function of the time of reaction, and Fig. 5 gives the change of the initial concentration of the aqueous hexamethylene diamine solution as a function of the time of reaction. The authors thank V. A. Gorbunov for his assistance in developing the method for the measurement of the electrical conductivity. Ye. P. Sanugol'tseva also cooperated.

Investigation of the Reaction Kinetics of Interfacial Polycondensation by Measurement of the Electrical Conductivity

S/190/60/002/007/007/017
B020/B052

There are 5 figures and 2 references: 1 Soviet and 1 US.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute of Synthetic Fibers)

SUBMITTED: March 10, 1960

Card 3/3

MIKHAYLOV, N.V.; GORBACHEVA, V.O.; KOVALEVA, V.P.; KLYUYEVA, O.A.

Structure of polyamides obtained by interfacial polycondensation. Vysokom. soed. 2 no.8:1283-1286 Ag'60. (MIRA 13:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.

(Polyamides)

85424

S/190/60/002/011/023/027
B004/B060

15.8107

AUTHORS: Tokareva, L. G., Mikhaylov, N. V., Potemkina, Z. I., Kovaleva, M. V.

TITLE: Processes and Mechanism of the Aging of Synthetic Fibers. II. Studies in the Field of Polyamide Fiber Stabilization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 11, pp. 1728 - 1738

TEXT: The authors have earlier studied the action of heat and light upon polyamide fibers (Ref.3). They have arrived at the conclusion that heat and light effect irreversible oxidation processes so that the use of antioxidants can prevent these processes from taking place. In the article under consideration, the authors deal with the action of the following antioxidants upon the stability of the caprone fiber which was heated to 200°C for two hours: N,N'-di-β-naphthyl-p-phenylene diamine; 2,2'-methylene-bis-4-methyl-6-tert-butyl phenol; 2,6-di-tert-butyl-4-methyl phenol; 2,4,6-tri-(tert-butyl)-phenol; "Poligard": $[R\,C_6H_4\cdot O]_3P$;

Card 1/6

85424

Processes and Mechanism of the Aging of Synthetic Fibers. II. Studies in the Field of Polyamide Fiber Stabilization

S/190/60/002/011/023/027
B004/B060

dimethyl phenyl-p-cresol; dibutyl dihydroxy-diphenyl sulfide; product of the reaction of acetone with diphenyl amine; N,N'-phenyl cyclohexyl p-phenylene diamine; 2,5-di-tert-butyl hydroquinone; product of the reaction of acetone with aminophenol; N,N' diphenyl p phenylene diamine; product of the condensation of phenol with styrene, and phenyl β naphthyl amine. Stabilizers were added to the polymer in amounts of 0.1 to 1% prior to spinning of fiber No. 300. Additions of luminophores such as hydroxy phenyl benzoxazole, which serve as inhibitors of the destructive action of light, indicated that these substances had a thermostabilizing effect as well. The most reliable stabilizer is said to be N,N'-di-β-naphthyl-p-phenylene diamine (DNPDA) which was used in the further experiments. Table 3 shows the action of various additions of DNPDA upon the properties of the caprone fiber. When the fiber was irradiated with a mercury lamp for 20 hours a protective action was found to come both from DNPDA and from the luminophore hydroxy phenyl benzoxazole. The following results were obtained: 1) Aromatic diamines and their derivatives are efficient stabilizers. 2) On a long action of high temperatures upon the fiber (150°C during 100-150 h), the

Card 2/6

85424

Processes and Mechanism of the Aging of Synthetic Fibers. II. Studies in the Field of Polyamide Fiber Stabilization

S/190/60/002/011/023/027
B004/B060

DNPDA-stabilized fiber retained 80-85% of its original stability while a corresponding value of no more than 20-25% was found for untreated fibers 3) A brief action of high temperatures upon untreated fibers in nitrogen atmosphere (in the case of DNPDA treated fibers also in the air) effects reversible changes in stability Under these circumstances an untreated fiber undergoes irreversible oxidative processes in the air. 4) Both thermostabilizing and photostabilizing substances exhibited the same protection both against heat and light. N N Semenov is mentioned Gratitude is expressed to A. I. Korolev and his collaborators at the NIOPiK (Scientific Research Institute of Organic Semifinished Materials and Dyes) for their synthesis of DNPDA and to N. V. Demina jointly with the collaborators of the laboratoriya tekstil'nykh ispytaniy (Textile Test Laboratory) for their fiber analyses. A. M. Glebova took part in the work. There are 6 figures, 5 tables and 6 references: 4 Soviet, 2 US ' British and ' Czechoslovakian

Card 3/6

85424

Processes and Mechanism of the Aging of Synthetic Fibers. II. Studies in the Field of Polyamide Fiber Stabilization

S/190/60/002/011/023/027
B004/B060

X

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute of Synthetic Fibers)

SUBMITTED: July 14, 1960

Card 4/6

S/190/60/002/011/023/027
B004/B060

1 Количество добавки ДНФДА, %	2 До прогрева			6 Прогрето 8 час. при 150°			9 Прогрето 48 час. при 150°			10 Прогрето 100 час. при 150°		
	3 $\eta_{уд}$	4 прочность, кГ/мм²	5 удлинение, %	3 $\eta_{уд}$	4 прочность, кГ/мм² / 7 сохранение прочности, %	5 удлинение, % / 8 сохранение удлинения, %	3 $\eta_{уд}$	4 прочность, кГ/мм² / 7 сохранение прочности, %	5 удлинение, % / 8 сохранение удлинения, %	3 $\eta_{уд}$	4 прочность, кГ/мм² / 7 сохранение прочности, %	5 удлинение, % / 8 сохранение удлинения, %
	0,775	75,0	18,0	0,496	64,7 59,7	15,1 83,8	0,333	25,1 33,5	10,0 55,6	0,304	19,2 25,8	8,3 46,0
0,5	0,796	76,0	13,6	0,859	75,0 99,9	21,0 161	0,842	65,2 85,8	16,4 120	0,827	66,6 88,0	16,8 125,5
1	0,749	76,1	15,0	0,825	74,7 98	20,5 136,6	0,827	65,5 86,2	17,4 116	0,769	66,5 87,4	19,3 128,7
0,5	0,745	75,0	17,9	0,851	71,1 95,2	23,4 131	0,938	61,5 82,0	18,4 103	0,825	62,6 83,8	19,9 111

Table 3

Card 5/6

Legend to Table 3: Changes of caprone fiber properties on long heating
1 - Addition of DNPDA, %, 2 - prior to heating,
3 - η_{spec}, 4 - strength, kg/mm^2, 5 - elongation, %,
6 - 8-h heating to 150°C, 7 - residual strength, %,
8 - residual elongation, %, 9 - 48-h heating to
150°C, 10 - 100 h heating to 150°C.

Card 6/6

15 5540

S/183/60/000/006/002/005
B020/B058

AUTHORS: Mikhaylov, N. V., Mayboroda, V. I., Nikolayeva, G. S.

TITLE: Some Rules Governing the Fibration of Polyamides at the Interface

PERIODICAL: Khimicheskiye volokna, 1960, No. 6, pp. 10-14

TEXT: In their study of some rules governing the interfacial polycondensation of monomer solutions, V. V. Korshak and collaborators (Refs. 2, 3) pointed to the non-equilibrium character of this reaction basing on the example of the interaction of adipic dichloride with hexamethylene diamine. The aim of the study under review was the elaboration of a shaping method for fibers and the study of some rules governing the interfacial polycondensation of polyamides. According to the method proposed (Fig. 1), one of the monomers (sebacic chloride solution in dichloro methane, for example) is pressed through a spinneret into the enlarged part of a tube at a rate of 90 to 100 m/min, while the solution of the other monomer (an aqueous hexamethylene diamine solution, for example) enters the tube through another opening at a rate of 10 to 20 m/min. A filament is formed at room

Card 1/3

87477

Some Rules Governing the Fibration of Polyamides at the Interface S/183/60/000/006/002/005 B020/B058

temperature on the contact of these two monomer flows; it is wound on the bobbin after stretching by 20 to 30% and washing. After drying the fiber is stretched by 4 to 5 times on a heated surface at a temperature close to the melting point of the polymer. The results mentioned refer to the monomer system sebacic chloride-hexamethylene diamine and adipic chloride-hexamethylene diamine. The intrinsic viscosity of the polymer and the fibration greatly depend on the purity of the initial monomers (Table 1). The change of concentration of the hexamethylene diamine has a considerable influence on the yield of polyhexamethylene sebacic amide. An increase of the component ratio influences the properties of the fiber, makes it more brittle and reduces its strength (Tables 2, 3). At surface tensions lower than 7-8 erg/cm^2 at the interface of the monomers, no filament is formed. Depending on the flow velocity of the monomers, the polymer develops in the form of a continuous filament or individual flakes (Table 4). Mentioned are the effect of various thickening agents added on fibration, properties of the polymer (Table 5) (ethyl cellulose being selected as the most suitable agent), as well as the corresponding effect of ethyl cellulose (Table 6). The effect of the polymeric thickening agents (starch, carboxy methyl cellulose, polyvinyl alcohol and oxy-ethyl cellulose, is mentioned

Card 2/3

in Table 7. Tables 6 and 7 show that the addition of some thickening agents to the aqueous and organic phase increases the yield of polymer and improves fibration. At a ratio hexamethylene diamine : sebacic chloride of from 1 : 1 to 2 : 1, a fiber develops with a ribbon-shaped cross section and almost agglutinated inner walls (Fig. 2), while at a ratio of 3 : 1 and more, the cross section is rather round and the inner walls are not agglutinated (Fig. 3). On the basis of the X-ray structural analysis, it was shown that the crystallinity of the fiber is increased through elongation, but its strength is not raised greatly (Fig. 4). The fiber obtained by interface polycondensation can be reinforced by stretching over a heated surface at 200 to 205°C which points to a condensation of its structure (Figs. 5, 6). The orientation of the fiber by elongation can be seen on the X-ray pictures(Figs. 7, 8).There are 8 figures, 7 tables, and 9 references: 4 Soviet, 4 US, and 1 German.

ASSOCIATION: VNIIV (All-Union Scientific Research Institute of Synthetic Fibers)